

## SPECIAL CONSERVATION REVIEW

### GUAM: A PROBLEM IN AVIAN CONSERVATION

THE NATIVE FOREST BIRDS OF GUAM. Ornithological Monographs No. 31. By J. Mark Jenkins. American Ornithologists' Union, Washington D.C., 1983:61 pp., color frontispiece, 6 color plates with caption figs., 14 range maps included among 24 numbered text figs., 6 tables. \$9.00 (\$7.00 to AOU members). NATURAL HISTORY OF THE GUAM RAIL. By J. Mark Jenkins. Condor 81:404-408, 1979. FOREST BIRDS OF GUAM. By John Engbring. Endangered Species Technical Bulletin 8:6-7, 1983 (January). GUAM: PARADISE LOST FOR WILDLIFE. By Julie A. Savidge. Biological Conservation 30:305-317, 1984.—I compliment the Division of Aquatic and Wildlife Resources, Department of Agriculture, Government of Guam, for sponsoring the biological field studies on Guam by Mark Jenkins, their staff, and visiting scientists from other agencies. These resulting papers, based on data gathered by the Division going back to 1960, are a response to the crisis occasioned by the sudden collapse of forest bird populations during the 1970s. In August 1978 the Division proposed seven bird species and two fruit bats (*Pteropus mariannus* and *P. tokudae*) of Guam for inclusion on the U.S. Endangered Species List. Actual listing did not transpire until 27 Aug. 1984.

The monograph by Mark Jenkins consists principally of 11 species accounts. Each starts with the name of the bird, followed by paragraphs under headings of description, distribution, habitat, behavior, food habits, nesting, and status on Guam. A graph for each species shows changes in numbers from 1974 to 1979 based on standardized road counts and station counts, whereas shading on a map indicates distribution and abundance on Guam in 1979. Photographs of eight forest species are displayed, most of them in color. Two color views of "limestone forest" show the area where nearly all native Guam bird species were concentrated during 1978 and 1979. Conclusions are that by 1979 the native forest birds of Guam occupied only 5-10% of their historical island-wide distributions; that they had contracted into the northern tip of the island; that abundant suitable habitat was now vacant; and that most of these bird species were in immediate danger of extinction.

The monograph is designed for professional zoologists. Nevertheless the color photos of gorgeous Micronesian birds, the ample size of graphs and maps, and a direct writing style make the grim message perfectly understandable to conservationists and amateurs. Absence of encumbering technical terms and mumbo-jumbo from ecology and "island biogeography" is gratifying. What good are equilibrium formulae in a crisis like this?

The author's aim is to bring together what is known of Guamanian birds, to compare their historical distribution and abundance with that of the present, to encourage further study, and to "stimulate concern for a unique and disappearing avifauna." In this he succeeds. Reading the book is a good start for learning about the Micronesian avifauna and for understanding how to avoid similar catastrophes on other islands. Editing and printing is up to the high standards of the AOU Monograph series. I object only to the habitat photographs that do not look like forest—the majestic rain forest that Rollin Baker, David Johnson, Henry Dybas, and I walked beneath at Ritidian Point in 1945. I thought "No wonder the birds are going, if they have only these bushes and weeds to live in." I am assured by recent visitors to Guam, however, that these scenes portray some of the original canopy of trees, of stature commensurate with the tall palms seen along the beach in the lower plate (p. 27).

Although there was no delay in publication once the manuscript was received, the fact is that Mark Jenkins' monograph and his companion piece on the Guam Rail (*Rallus owstoni*) bring us only up to 1979! After that, things begin to happen fast. Jenkins' dire predictions

are largely fulfilled. The Division of Aquatic and Wildlife Resources had to make another survey with John Engbring in 1981 and had to grapple with the disease-versus-predation problem soon thereafter, with the help of Julie Savidge. Engbring's results and a preview of the course of Ms. Savidge's research, together with a good bibliography on the entire biota, are in the two additional papers listed at the head of this review.

Minor errors or sources of misunderstandings include Jenkins' belief that introduction of the giant African snail (*Achetina fulica*) influenced the Guam Rail to become an eater of gastropods. Actually a rich native fauna of snails and slugs had nourished the rail as it did the Nightingale Reed-warbler (*Acrocephalus luscini*a). Was this natural food source destroyed by the predatory snail and flatworm introduced for biological control of *Achetina*? Jenkins uses a misnomer for the brown tree snake, *Boiga irregularis*. He calls it the "Philippine rat snake," a name that applies to *Elaphe erythrura*. *Boiga irregularis* does not occur in the Philippines, was first found on Guam in 1947, was probably carried in by the military from New Guinea or Biak during World War II, finds its most apt common name in the German "Nacht Baumnatter" or nocturnal tree-adder, and is well known as a predator of birds and their eggs in Australia. Ms. Savidge refers to Rota, Tinian, and Saipan as "the Northern Marianas," a recently formed political unit. But in the biological literature, "northern Marianas" refers to smaller, volcanic islands farther north. There, in 1979, Roger Clapp of the Biological Survey Section, U.S. Fish and Wildlife Service, found large sea bird colonies. He reported that hunters were taking Marianas fruit bats (*Pteropus mariannus*) for the Guam market, and that abundant Micronesian Megapodes (*Megapodius laperouse*) deposited their eggs in gravel warmed by the volcanos.

Because Jenkins' population estimates unfortunately no longer reflect present numbers, I should depart from the ordinary review at this point and bring the story up to the beginning of 1985, in the form of an annotated species list. It is based in part on Julie Savidge's presentation at the 1983 New York meeting of the AOU. I have developed the remaining story—I hope I have it all straight—from correspondence or conversations with biologists who have studied or are now studying the flora and fauna of Guam. At the 1983 centennial meeting of the AOU, Ms. Julie Savidge, whose work is another credit to the Division of Aquatic and Wildlife Resources, took by surprise a standing-room-only audience who came to hear her presentation of "Reasons for the decline of Guam's avifauna." Ms. Savidge presented circumstantial evidence incriminating *Boiga irregularis*. For each of a series of time-lapses, the distribution maps of the snake's northward expansion complemented those of the retreating bird populations. Seemingly in a state of shock, some of the audience, during the question period, asked questions or volunteered statements that were unscientific, unchivalrous, and embarrassing to the rest of us. Few could believe that a mere snake was that efficient a predator and could build up the numbers commensurate with such devastation.

Apparently after keeping a low profile in southern Guam through the 1950s and 1960s this nocturnal, tree-climbing snake suddenly expanded its population in the late 1970s. It hit the Air Force area in a wave. Electric outages due to snakes climbing into circuitry increased eight-fold in six years, and cost \$13,000,000 between 1978 and 1982. Division personnel are now radio-tracking the snakes and have conducted feeding and baiting experiments that show the snake's great numbers in trees at night and its expertise at catching all sleeping birds. This just about fixes the entire blame upon the snake unless some still-to-be analyzed samples in Julie's elaborate series of disease experiments incriminate microorganisms as well. At any rate, the only hope for the remaining Guam endemic bats and birds seems to be captive breeding and removal to safety on nearby Bota.

Herewith is the latest word-of-mouth status of the birds:

- Wedge-tailed Shearwater (*Puffinus pacificus chlororhynchus*).—Guam population long extinct.
- Yellow Bittern (*Ixobrychus sinensis*).—Declining. The only native Guam bird that still maintains an island-wide distribution.
- Mariana Mallard (*Anas oustaleti*).—Entire species became extinct in 1960s. Not a hybrid. The wrong picture in my article (Condor 51:204, 1949) may have encouraged this notion; the photo is of an Australian Gray Duck (*Anas superciliosa*).
- Micronesian Megapode (*Megapodius laperouse laperouse*).—Disappeared from Guam before the 20th Century. Still common in the northern Marianas.
- White-browed Rail (*Poliolimnas cinereus micronesiae*).—Guam population disappeared sometime during the 1960s or early 1970s.
- Guam Rail (*Rallus owstoni*).—This flightless rail is an endemic species solely of Guam. It was granted emergency listing on the U.S. Endangered Species List on 11 April 1984 through the cooperation of the Division of Aquatic and Wildlife Resources (Department of Agriculture, Government of Guam), the Environmental Defense Fund, and the Departments of Interior and Defense. The emergency was occasioned by the intention of Andersen Air Force Base to clear the forest habitat of the last continuous breeding population of the Guam Rail. The Air Force has prepared an environmental impact statement and will eventually clear this area adjacent to an existing parking ramp. On 27 Aug. 1984 the bills and other birds from the original proposals of 1978 were entered on the U.S. Endangered Species List. A captive breeding program for the rail and other species was started at Guam, the Philadelphia and Bronx Zoos, the National Zoological Park, and, recently, the Denver Zoo; it is being coordinated by the American Association of Zoological Parks and Aquariums. The Guam Rail nests again as soon as its young are independent, so that captive breeding by the Division on Guam continues to be successful and several broods have been raised at the Smithsonian's Front Royal facility (National Zoological Park, Conservation and Research Center). The rails at the north end of the Air Force runway are still there but probably declining. The total population is no more than 100 birds.
- Guam Gallinule (*Gallinula chloropus guami*).—Listed as endangered on 27 Aug. 1984; still holding its own in remaining marshes. Although it was named from Guam, this race of the Common Gallinule occurred or still occurs on other islands of the Marianas that support marshes.
- White-throated Ground Dove (*Gallicolumba xanthonura xanthonura*).—About 500 in 1979; now uncommon at north end of island.
- Mariana Fruit Dove (*Ptilinopus roseicapilla*).—Less than 300 in 1979, now very rare.
- Vanikoro Swiftlet (*Aerodramus vanikorensis bartschi*).—Listed as endangered on 27 Aug. 1984. About 225 remain at an active breeding cave.
- Guam Micronesian Kingfisher (*Halcyon cinnamomina cinnamomina*).—A unique subspecies found only on Guam, and the only population of Micronesian Kingfishers in the Marianas Islands. Listed on 27 Aug. 1984. About 25 pairs remain on Guam. Twenty-one sent to the United States have not yet bred. Printing errors in the table of my article (Condor 51:211, 1949) are corrected by removing the word "same" from the line pertaining to the juvenal plumage. I had no juveniles of *pelewensis* and *teraokai* for comparison.
- Guam Broadbill (*Myiagra freycineti*)—A unique species of Guam. Listed as endangered on 27 Aug. 1984. Too rare for captive breeding. Last two seen March and Sept. 1984. Printing errors in my table (Condor 51:215, 1949) can be corrected by deleting the words "more salmon" from the bottom of the right-hand column on the line pertaining

to extent of white, and by adding "same as male" at the bottom of both female columns on the line pertaining to tone of orange.

Rufous-fronted Fantail (*Rhipidura rufifrons uraniae*).—There were two or three singing males in July 1984. Inadvertently left off list proposed for endangered status in 1978; now proposed and near extinction. Too rare for captive breeding.

Nightingale Reed-warbler (*Acrocephalus lusciniia lusciniia*).—Vanished in the 1960s when the marshes were drained and developed.

Guam Bridled White-eye (*Zosterops conspicillata conspicillata*).—A subspecies found only on Guam. Was too rare for captive breeding when listed as endangered on 27 Aug. 1984 and now extinct. A printing error in my table (Condor 51:217, 1949) can be corrected by adding the figure "8" to the line pertaining to immatures from Tinian, in the column for yellow base of lower mandible.

Cardinal Honeyeater (*Myzomela cardinalis saffordi*).—Confined to northern tip of island in 1981; very rare at present.

Micronesian Starling (*Aplonis opaca guami*).—Still occupies about one-tenth of original range but nowhere common.

Mariana Crow (*Corvus kubaryi*).—Found only on Guam and the neighboring island of Rota. Listed as endangered on 27 Aug. 1984. Now less than 100 remain on Guam.—JOE T. MARSHALL, U.S. Fish and Wildlife Service, National Museum of Natural History, Washington, D.C. 20560.